



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/060,797	01/29/2002	Ken Sakuma	113197-023	8252
24573	7590	06/09/2005	EXAMINER	
BELL, BOYD & LLOYD, LLC			LEE, HWA S	
PO BOX 1135			ART UNIT	PAPER NUMBER
CHICAGO, IL 60690-1135			2877	

DATE MAILED: 06/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/060,797

Applicant(s)

SAKUMA ET AL.

Examiner

Andrew Hwa S. Lee

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-16,18 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1,2,5-16,18 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Remarks

1. This Office Action is in response to Applicant's amendment of 4/1/05. Claims 1, 16 and 20 are amended. Claims 3, 4, 17 and 19 are cancelled. Claims 1, 2, 5-16, 18, 20 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1, 2 and 10-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al, Patent Abstracts of Japan, Publication No. 11167036 ("PAJ '036" hereinafter) in view of Yoshimura (Patent Abstracts of Japan 07-063936) and Kondo et al (Optic Letters Vol. 23, No. 10, pp. 646-648)

PAJ '036 shows an optical waveguide circuit comprising a coupler/splitter. PAJ '036 does not expressly show adjusting/forming of the refractive index area and the monitoring of the light passing through the waveguide.

PAJ '036 shows a coupler/splitter in a waveguide having a core formed by focusing a laser beam to adjust/form a refractive index area.

Yoshimura shows the production of a waveguide which easily adjusts the coupling rate and branching ratio of a coupler/splitter comprising the steps of:

setting at least one portion between said ports as a refractive index adjustment area (17, 18, 20, 21, 39);
inputting signal light into one port (P1) and monitoring the signal light outputted from other ports (P1' and P2'); and
adjusting optical characteristics of said optical coupler by forming said refractive index adjustment area of said waveguide by adjusting a refractive index of said refractive index adjustment area by focusing a laser beam onto said refractive index adjustment area during the monitoring (Abstract).

At the time of the invention, one of ordinary skill in the art would have adjusted the coupling rate and branching ratio of the coupler/splitter in order to fine tune the coupling rate and branching ratio at the desired amounts. One of ordinary skill in the art would have recognized that the principle of using a focused beam to adjust the branching ratio of a coupler/splitter in a plastic waveguide can be used in a glass waveguide. The skilled artisan would have also used a laser beam to adjust the refractive index in the glass waveguide rather than UV light which is effective for plastic waveguides since Kondo teaches that laser is effective for glass waveguides and Yoshimura teaches that UV light is effective for plastic waveguides.

4. **Claims 5- 9, 16, 18, and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over "PAJ '036" in view of Yoshimura as applied to claim 1 above, and further in view of Miura, K., et al., ("Photowritten optical waveguides in various glasses with ultrashort pulse lasers" Applied Physics Letter, Vol. 71, No. 23, December 8, 1997, pp. 3329-3331.)

All the steps of claim 5 and 16 are shown as applied to claim 1 above but does not expressly show the determination of the number of scanings by a femto-second laser beforehand. One of ordinary skill in the art would have deduced from the teachings of Muira, K. that a predetermined number of scanings can be estimated because each scan resulted in a certain amount of change in refractive index and knowing how much of a change in refractive index is desired, the skilled artisan would be able to estimate the number of passes required. Furthermore, Miura, K. teaches that the laser is to be a femto-second laser, thus one of ordinary skill in the art would have used a femto-second laser in order to change the refractive index of the glass waveguide.

Response to Arguments

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "However, forming a waveguide core having an area in which the waveguide core is not formed, and then forming the refractive index adjustment area..." on the fourth paragraph of page 7, or "...having arbitrary optical characteristics of the first paragraph of page 8) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

With regards to *Kondo I* showing that the lightwave circuit device is assembled by a plurality of glass materials, the Office was not looking to that particular teaching, but rather the

Art Unit: 2877

teachings with regards to Figures 1, 2, and 3 showing a coupler/splitter in a waveguide having a core formed by focusing a laser beam to adjust/form a refractive index area

With regards to *Kondo I* not showing the adjusting of the refractive index, the Office was not looking to *Kondo I* for that particular teaching. Rather, the Office was looking to Yoshimura for the teaching of adjusting the refractive index area.

With respect to Applicant's argument that Miura does not show a refractive index adjustment area and the repeated scanning of the laser. Miura teaches that the refractive index is changed in the core by the laser, thus there is an area where the refractive index is adjusted.

With regards to the repeated scanning, Miura teaches that different conditions are tested such as laser average power and pulse duration, and it is well within the skills of one of ordinary skill in the art to have considered repeated scanning since Miura teaches that a scan produces a certain amount of change in the refractive index. Please see for example an earlier article co-authored by K. Miura, "Writing waveguides in glass with a femtosecond lasers," (Optic Letters) where such repeated passing of the laser is shown.

In summary, the Office submits that based on the teaching of *Kondo I* (PAJ '036) forming of a coupler/splitter in a waveguide having a core formed by focusing a laser beam to adjust/form a refractive index area (core) and Yoshimura's teaching that the coupling or splitting characteristics of a coupler/splitter can be corrected or adjusted by focusing a laser onto the waveguide and observing the optical characteristics, that one of ordinary skill in the art at the time of the invention would have formed a coupler/splitter by focusing a laser to form a waveguide and then would have corrected for optical characteristics of the coupler/splitter by

Art Unit: 2877

monitoring light traveling through the ports and focusing a laser to the core to adjust the refractive index of the core.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Hwa S. Lee whose telephone number is 571-272-2419. The examiner can normally be reached on Tue-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on 571-272-2800 ext 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2877

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Andrew Hwa Lee', with a stylized, flowing script.

Andrew Hwa Lee
Primary Examiner
Art Unit 2877